

CLAIMS

I claim:

1. A shoring device, said shoring device comprising:

15 (A) A piston and a cylinder, said cylinder partially enclosing said piston, said piston and said cylinder each comprising an interior wall, said cylinder having a longitudinal axis and said piston having a longitudinal axis, said piston and said cylinder each comprising a distal end and a proximal end, said piston and said cylinder each comprising an exterior wall, each said piston and cylinder comprising
20 an interior wall and a pre-determined wall thickness

(B) At least one straight metal cam pin, and

(C) A mechanical device, said mechanical device encircling said piston and said cylinder,

Wherein said mechanical device comprises in combination,

(1) An outer cam collar, said outer cam collar comprising a penetrating component, said outer cam collar movably positioned along said longitudinal axis of said piston, said outer cam collar engaging said cylinder and said piston,

5 (2) An inner ring, said inner ring attached to and encircling said cylinder, said inner ring comprising a continuous circular indentation, said continuous circular indentation comprising an indentation floor, said inner ring further comprising a abutting component, said outer cam collar concentrically enclosing said inner ring,

Whereby said outer cam collar is prevented from rotation by said penetrating component

10 abutting said indentation floor,

Whereby said piston is prevented from rotation by said penetrating component abutting said indentation floor through friction, and

Whereby said abutting component abuts said piston and prevents said piston from becoming a projectile.

15

2. A shoring device as described in Claim 1, wherein said penetrating component is a threaded pin.

20 3. A shoring device as described in Claim 2, wherein said abutting component is an inner continuous circular lip.

4. A shoring device as described in Claim 3, wherein said outer cam collar comprises a plurality of handles, said outer cam collar further comprising an integral boss for insertion of said threaded pin.
5. A shoring device as described in Claim 2, said shoring device further comprising at least one U-shaped removable side plate, said U-shaped removable side plate reversibly attaching to said cylinder or said piston by insertion of a détente pin through a plurality of apertures.
- 10 6. The shoring device as described as described in Claim 3, wherein said outer cam collar comprises a first and a second cam stop face, at least one of said cam stop faces tightly abutting said straight metal cam pin, said straight metal cam pin thereby preventing rotation of said cylinder relative to said piston.
- 15 7. A shoring device as described in Claim 3, wherein said shoring device expands longitudinally and axially by extrinsic air pressure, said air pressure entering said cylinder at only one specific numerical value.
8. The shoring device as described in Claim 5, wherein said circular continuous
20 indentation comprises a first indentation wall and a second indentation wall, said indentation walls being perpendicular to said indentation floor.
9. The shoring device as described in Claim 6, wherein said indentations walls are each approximately one-eighth inch in height and said indentation floor is approximately

three-quarters inch in width.

10. A pneumatic shoring device for shoring of trenches comprising

(A) A cylinder which is hollow and cylindrical in shape, said cylinder comprising a

5 removable attachable cylinder swivel side plate at a proximal cylinder end, said
attachable cylinder swivel proximal side plate engaging with a shoring board lining a
wall, said cylinder further comprising an inlet for pressurized gas at a single numerical
value from an exterior source, said cylinder further comprising a cylindrical plug,

10 (B) A piston, said piston being hollow and cylindrical in shape, said piston comprising a
lesser diameter than said cylinder, said piston comprising a removable swivel distal
piston side plate at said distal piston end for engagement with wooden boards, said piston
further comprising a piston rubber end cup, said piston rubber end cup secured at said
proximal end of said piston,

15 (a) said rubber piston end cup creating an airseal,

(b) said piston comprising a plurality of linearly aligned axial longitudinal apertures,

(C) An outer cam collar, said outer cam collar comprising a collar interior surface, said
collar interior surface comprising one distal step and one proximal step, said distal step
20 comprising a narrow diameter than said proximal step, said distal step abutting said
proximal end of said piston when said piston is axially inserted into said cylinder,

(1) Said outer cam collar rotating around said distal end of said cylinder, said outer
cam collar having an axially extending distal edge surrounding said piston, said distal

edge comprising a cam surface comprising two vertical stop faces and two continuous sloping cam surfaces,

(2) Said outer cam collar further comprising in combination an abutting element, said
5 abutting element comprising a threaded pin,

(D) An inner ring, said inner ring comprising a hollow cylindrical segment, said inner ring enclosing said distal cylinder end, said inner ring attaching to said cylinder with mechanical fasteners, said inner ring positioned concentrically beneath said outer cam
10 collar whenever said pneumatic shoring device is fully assembled, said inner ring comprising a proximal edge and a distal edge, said inner ring comprising at least one circumference which is parallel to said proximal edge and said distal edge, said inner ring further comprising

(a) a continuous circular indentation along said circumference of said inner ring,
15 said continuous circular indentation comprising a smooth continuous indentation floor, said continuous circular indentation comprising a first perpendicular wall and a second perpendicular wall, said continuous circular indentation being uniform in width and depth, said first and second perpendicular walls being perpendicular to said smooth continuous indentation floor, said inner ring comprising apertures for at least two set
20 screws,

(b) said threaded pin penetrating said exterior cam collar wall and tightly abutting said smooth continuous indentation floor,
said inner ring thereby stabilizing said outer cam collar rotationally, whenever said piston is inserted within said cylinder,

- (E) A straight metal cam pin, said straight metal cam pin reversibly inserting within one pair of opposing apertures within said piston,
- 5 Whereby after introduction of pressurized gas into said cylinder, said piston extends laterally after said piston rubber end cup creates an air seal, said piston and cylinder being secured in the resulting extended condition by said straight metal cam pin abutting said cam surface, said threaded cam pin abutting said circular continuous indentation and said inner continuous longitudinal lip abutting said piston.
- 10
11. The shoring device as described in Claim 1 wherein said inner ring and said outer ring comprise aluminum.
12. The shoring device as described in Claim 1 wherein said piston and said cylinder
15 comprise aluminum.
13. The shoring device as described in Claim 1 wherein said inner ring and outer cam
collar comprise aluminum.
- 20 14. The pneumatic device as described in Claim 10 wherein said inner ring and outer cam
collar comprising aluminum 356-T sand castings.
15. The shoring device as described in Claim 1 wherein said cylinders and pistons
comprise aluminum type 6061-T6.

16. The pneumatic shoring device as described in Claim 10 wherein said cylinders and
said pistons comprise aluminum type 6061-T6.
- 5 17. The pneumatic shoring device as described in Claim 10 wherein said threaded cam
pin comprises a 356-T sand casting.
18. The pneumatic shoring device as described in Claim 10 wherein said cylinders and
said pistons comprise aluminum type 6061-T6 and said inner ring, said outer cam collar
10 and said threaded pin comprises aluminum 356-T sand castings.
19. The pneumatic shoring device as described in Claim 10 wherein said cylinder end
plug comprises a circular groove, said circular groove containing an O-ring.
- 15 20. The pneumatic shoring device as described in Claim 19 wherein said piston end cup
comprises neoprene rubber.
21. The pneumatic shoring device as described in Claim 20 wherein said cylinder end
plug comprises a 356-T aluminum sand casting.

20

25